

**Animal Health
Fact Sheet**

VACCINATION PROGRAMS FOR DAIRY YOUNG STOCK

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Vaccines are an important tool to use in herd health programs for the protection of animal health. However, vaccines often do not protect health by themselves, and should be used in conjunction with good management practices. The timing of vaccination and selection of product type are important considerations. It is best to use vaccines as part of a total herd health program. Your local veterinarian, who understands the local and current conditions, is an important advisor for any health program or vaccination schedule you plan to implement.

CRITICAL CONTROL POINTS

There are four points that are critical for calf health before vaccines are even considered. These include nutrition, care of the newborn, sanitation and housing.

It is critical that the cow receive adequate nutrition during the last 60 days of gestation. The nutrients for the cow that are of special concern for calf health are protein, energy, vitamins A and E and the trace elements, especially copper, selenium and zinc. After birth, the calf must continue to receive adequate nutrients. This is especially critical during winter (cold weather) to provide the calf with energy for body heat.

Newborn calves should receive 2 to 4 quarts of good quality colostrum within the first two hours of life. The navel should be clipped to one inch and soaked in iodine or chlorhexidine. Especially in cold weather, dry the calf off and provide supplemental heat or cover with a “calf jacket” to help conserve its body heat. Calves are not able to control their body heat well during the first few days of life and are very susceptible to cold stress which decreases their ability to absorb colostral antibodies.

It is critical that the environment for the new calf is clean for its birth and early life. The maternity stall must be thoroughly cleaned after each delivery. The calf hutch or other housing must likewise be cleaned, sanitized and exposed to the sun prior to placing a newborn calf in it.

In addition to being clean the housing must be, and remain, dry. It must also be well ventilated (not drafty) or calves placed there will die from pneumonia in spite of other efforts that are made.

GOALS OF VACCINATION

A number of different vaccines and combinations are available for cattle. Carefully consider those which are really needed as you select from those available. The multiple brand names and combinations of products can be very confusing. This will be less of a problem if you decide what specific diseases or organisms you want to vaccinate for and then begin to select from the products available.

Vaccines are not 100% effective to 100% of the animals vaccinated but they do increase the level of immunity in a herd and the relative resistance of individual animals. The goal is to protect the calf against potential disease agents, begin to provide for protection for the calf's entry into the adult herd, and to increase or at least maintain the level of herd immunity.

VACCINES TO STRONGLY CONSIDER

The clostridial diseases include blackleg, enterotoxemia, etc., and products are available in various combinations of from two to eight agents. These diseases are common and usually cause sudden death with little time for treatment, so vaccination is usually recommended. Most of these products also require that two doses be given; one as a priming or beginning dose and a second or booster dose 3 to 4 weeks later. Little protection is provided by the vaccine until 1 to 2 weeks after the second dose of vaccine is given.

Four viral agents commonly cause respiratory or reproductive problems:

- IBR (infectious bovine rhinotracheitis)
- PI3 (parainfluenza type 3)
- BVD (bovine virus diarrhea)
- BRSV (bovine respiratory syncytial virus)

All of these commonly occur in our dairy cattle and basic herd protection should be provided. Both modified live virus (MLV) and killed (inactivated) products are available. Both types have their place for consideration in a vaccination program. Most MLV products can cause abortion and fetal defects if given to pregnant dams so only specifically designed vaccines or killed products should be given to pregnant dams or animals mixing with them. Some of the fetal effects of BVD infection can be prevented with a good vaccination program. All replacement heifers should be vaccinated with at least one dose of a MLV, BVD product at 4 to 8 weeks prior to breeding. Additional doses, prior to that, may also be of value.

The *Escherichia coli* (E. coli) type organism is involved in coliform mastitis and the vaccines for this have been shown to be effective and economically worthwhile. Multiple doses are required but will result in a greatly improved vaccine response.

Leptospirosis has not seemed to be as common in recent years but is still present. It would be best to have a reasonable level of herd immunity to this agent. Several strain combinations are available but it is usually best to use the five strain type of vaccine to provide a broader spectrum of protection.

Brucellosis has been essentially eliminated from all cattle in the U.S. However, it is still present in some wildlife (elk and bison in the Greater Yellowstone area). Regulations in some states still require vaccination for cattle to enter. This vaccine must be given by an Accredited Veterinarian, when the heifer is from 4 to 12 months of age and cannot be given later in life. A legible tattoo is essential.

OTHER VACCINES TO CONSIDER

A variety of other vaccines are available and at least the following could be considered for special situations which would warrant it. Consult with your veterinarian. Plan carefully to incorporate the initial vaccination and needed boosters into your vaccination schedule.

- Scours vaccine (rota virus, corona virus, and E. coli with the K99 antigen)
- Campylobacter (used to be called vibrio)
- Pasteurella (involved in pneumonia)
- Pinkeye
- Salmonella

INJECTION SITE LESIONS AND BEEF QUALITY ASSURANCE

The injection of vaccines into muscle tissue very commonly produces lesions and scar tissue which remains for life. Injections occasionally produce abscesses, which is even worse. Since dairy animals usually end up as beef animals as well, the guidelines for Beef Quality Assurance should be followed. When at all possible, select vaccine products which can be administered subQ (subcutaneously). If a product must be given intramuscularly, give it into the muscles of the neck, in front of the shoulder. Injections into the muscle masses of the rump and hindquarters has created great problems because of injection lesions in these sites. These cuts of meat from dairy cattle are often used for sandwich meats and are not all just ground into hamburger as some producers suppose. Research with beef cattle has shown that vaccines given to baby calves in these muscles of the rear quarters also cause lesions that are still present at slaughter several months later. Even for calves, all vaccines should be administered in front of the shoulder.

CAUTIONS WITH VACCINE ADMINISTRATION

Be aware that anaphylactic (allergic) reactions are always possible when administering vaccines and be prepared with at least some epinephrine available.

Recent work has shown that vaccines prepared from gram negative bacteria may contain sufficient amounts of endotoxins to cause clinical effects. Lepto, campylobacter, salmonella, E. coli and pasteurella vaccines could all be potential problems. It has been recommended that not more than two of these products be administered at one time.

Cattle tend to hold their body heat in hot weather and may be severely stressed by working them later in the day when it is hot and humid. If the temperature is over 85 degrees Fahrenheit with over 40% humidity, the cattle should be worked in the early morning while it is cooler.

It has recently been shown that use of the injectable type of IBR vaccine to calves under five days of age may result in a massive infection by the herpes type one virus. If calves are to be vaccinated at less than five days of age, the intranasal product should be used. Even for calves less than three months of age the intranasal product tends to give the best results because it is less affected by colostral immunity.

GUIDELINES FOR VACCINE CARE AND HANDLING

- Read and follow directions for the specific product used.
- If two doses are recommended - give two doses, or there will be very little immunity.
- Calves vaccinated when under 6 months should usually be vaccinated again after 6 months of age.

- To obtain a benefit in the colostrum, from vaccination, give the last prescribed dose of the vaccine at least 4 weeks pre-calving.
- Refrigerate and store vaccines as directed on the label. Use an ice cooler to protect vaccines while they are away from the refrigerator.
- Mix only an amount of vaccine which can be used within an hour and then mix more again. Keep the mixed vaccine out of direct sunlight and excessive heat.
- Remember that some vaccines may cause abortion (IBR) and fetal defects (BVD). Always read the label and be sure the product is suitable for the animals to be vaccinated. If you are unsure, talk to your veterinarian or call the company direct, before you use the product.

Example Vaccination Program - High Producing Dairy

<u>Timing</u>	<u>Vaccines Used</u>
4 months	Clostridial diseases (7 way) IBR, PI3, BVD, BRSV (MLV product) Lepto
10 months	Clostridial diseases (7 way) IBR, PI3, BVD, BRSV (MLV product) Lepto
Dry Off	Clostridial diseases (7 way) Vitamin E
Fresh Cows (14-28 days)	IBR, PI3, BVD, BRSV (MLV product) Lepto

Example Vaccination Program - USU Caine Dairy

<u>Timing</u>	<u>Vaccines Used</u>
1 week	IBR, PI3 (intranasal, MLV)
6 weeks	IBR, PI3, BVD, BRSV (MLV)
10 weeks	IBR, PI3, BVD, BRSV (MLV) Lepto (5 strain)
24-28 wks.	Brucellosis 8-way Clostridial
Heifers (one month pre-breeding)	IBR, PI3, BVD, BRSV (MLV) 8-way Clostridial Lepto (5 strain)

Heifers (6 weeks before calving)	IBR, PI3, BVD, BRSV (killed) E. coli J-5 Scourguard 3KC
Dry Cows (6 weeks before calving)	IBR, PI3, BVD, BRSV (killed) E. coli J-5 Scourguard 3KC 8-way Clostridium
Dry Cows and Heifers (3 wks before calving)	E. coli J-5 Scourguard 3KC
Cows and Heifers (1-2 wks after calving)	E. coli J-5 Lepto (5 strain)

Example of Basic Vaccination Program

<u>Timing</u>	<u>Vaccines Used</u>
1-4 months	Blackleg / Malignant edema Enterotoxemia C & D IBR, PI3 (intranasal) BRSV
4 wks later	Blackleg / Malignant edema Enterotoxemia C & D BRSV
4 months	Brucellosis
12-14 months	Blackleg / Malignant edema Enterotoxemia C & D IBR, PI3, BVD, BRSV (MLV) Lepto (5 strain)
22 months (late pregnancy)	Enterotoxemia C & D E. coli J-5 Lepto (5 strain) IBR, PI3, BVD (killed)
Dry Off	Enterotoxemia C & D E. coli J-5 Lepto (5 strain) IBR, PI3, BVD (killed)

Other Vaccines to Consider (Implement Boosters as Directed)

7-8 way Clostridial, Pasteurella, Haemophilus, Scours vaccine (rota, corona, E. coli),
Salmonella,

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